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ABSTRACT

The Revised Children's Eating Behaviour Inventory, the Parenting Stress Index, and the Krug Autism Behavior Checklist were used to assess eating/mealtime problems and related variables in 33 young high functioning autistic children (mean age 5 years, 3 months), 295 normally developing children (mean age 5 years, 8 months) and 11 young boys (mean age 6 years, 2 months) with an identified eating problem. Results showed that 42 percent of the autistic children had a significant eating/mealtime problem. The presence of eating/mealtime problems was positively correlated with parent reports of greater severity of autistic behaviors and greater perceived stress in the parenting role but not with the child's intelligence level. Clinical implications suggest the need for clinicians to be sensitive to the possible presence of eating/mealtime problems and to provide the necessary assessment and treatment. (16 references) (DB)

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Eating and Mealtime Problems in Young Autistic Children: Prevalence and Correlates

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Abstract

Eating and mealtime problems are common in childhood. Autistic children by virtue of their impairments in social and communicative functions and their tendency toward stereotypical and ritualistic behaviors should be at risk for eating and mealtime (E/M) problems. There has been no systematic study of the prevalence, or type, of eating problems which occur in autistic children. In this paper, we report data from the revised Children's Eating Behaviour Inventory for 33 young autistic children, 295 normally developing children and 11 children with an identified eating problem. The results show that 42% of the autistic children have a significant E/M problem. In addition the presence of E/M problems is positively correlated with parent reports of greater severity of autistic behaviors and greater perceived stress in the parenting role, but not with the child's IQ level. Clinical implications for these results are discussed.

Eating and Mealtime Problems in Autistic Children: Prevalence and Correlates

Eating and mealtime (E/M) problems in childhood are common. The specific problems may include poor sucking, chewing or swallowing, gagging and vomiting, mealtime tantrums, picky eating, under or over intake of food (Linscheid, 1983). Clinical commentary and empirical reports indicate that E/M problems are highly stressful to both the child and the family (Archer, Cunningham & Whelan, 1988; Hagekull & Dahl, 1987). Autistic children by virtue of their tendency toward stereotypical, ritualistic behaviors, poor tolerance of novel stimuli and significant social and communication problems should be at risk for E/M problems. Autism exerts a considerable stress/burden on family members (Dumas, Wolf & Fisman, 1991; Noh, Dumas, Wolf & Fisman, 1989). The presence of an E/M problem may further add to that stress. A typical family eats two to three meals in a day. This means that there is repeated, daily exposure to the stressful situation. Over the longterm, the cumulative stress of trying to get one's child to eat and/or curb inappropriate mealtime behaviors can be great (Archer & Szatmari, 1990; Archer, Cunningham & Whelan, 1988).

The purpose of this study is twofold. Firstly, the frequency and type of E/M problems in families with autistic children is described. To date E/M problems in autistic children have been underdiagnosed and underreported. Secondly, we are interested in the predictors and correlates of E/M problems in autistic

children. We predict that E/M problems will correlate positively with autistic behaviors. Thus, we expect that children with higher scores on measures of autistic behaviors will also have higher scores on a measure of children's E/M problems.

Method

Subjects.

Thirty-three autistic children (30 boys, 3 girls) were recruited consecutively from a larger study of high functioning young autistic children. Inclusion criteria were: 1) age 4 to 6 years, 2) diagnosis of pervasive developmental disorder as determined by DSM-III-R criteria and, 3) intellectual level equal to or greater than 70 as determined by individual testing with either the Arthur Adaptation of the Leiter International Performance Scale (Levine, 1982) or the Stanford-Binet (4th ed.) (Thorndike, Hagan & Sutter, 1985). The autistic children were recruited from several preschool programs for autistic children in southern Ontario. The diagnosis of pervasive developmental disorder was made by P.S. using the Autism Diagnostic Interview (LeCouteur et al., 1989). The mean age of the autistic children was 5 years, 3 months. The mean IQ level of the autistic group was 87 (standard deviation-16). The nonclinic control group (n=295) was recruited by consecutive case procedures from community family physicians' offices during a larger study of children's E/M problems (Archer, Rosenbaum & Streiner, 1991). The mean age of these children was 5 years 8 months (149 boys, 146 girls). A group of children with identified eating problems

(n=11) was also recruited during that study, mean age 6 years, 2 months (11 boys). Further details of the nonclinic control and identified eating problem groups are given in Archer, Rosenbaum & Streiner (1991).

Instruments. The Revised Children's Eating Behaviour Inventory (CEBI), a new instrument to assess children's eating and mealtime problems (Archer, Rosenbaum & Streiner, 1991; Archer & Streiner, submitted) was given. The CEBI is a 19-item parent report instrument. The respondent indicates on a 5 point Likert scale how often the behaviour occurs (i.e. never, seldom, sometimes, often or always) and whether or not it is perceived to be a problem (yes/no response). Two scores are derived from the instrument: a total eating problem score and the percentage of items perceived to be a problem. The mother was also asked to indicate (yes/no) whether her child had had any E/M problems in the past six months or "now" at the time she was completing the CEBI. A score of 41 or greater (Archer & Streiner, submitted), was used as the cut-off point for an E/M problem.

The Parenting Stress Index (PSI) (Abidin, 1990), a standardized parent report measure, was given to assess maternal perceptions of child behavioral characteristics and the parenting experience. Three scores are derived from the PSI, an overall stress score, a total stress score for the Child Domain and a total score for the Parent Domain. To assess severity of autism the Krug Autism Behavior Checklist (Krug, Arick & Almond, 1980) was given. The Krug gives a total score for severity of autism as

well as scores on five subscales. The subscales are sensory, relating, body and object use, language and social and self-help. A cut-off score of 45 or greater is recommended as being indicative of autism. The CEBI, PSI and Krug questionnaires were all completed by mothers of the children.

Results

42% (n= 14) of the autistic children were identified to have an eating problem. A one way analysis of variance was done comparing the mean total eating problem scores from the CEBI for the nonclinic group, autistic children with an eating problem, autistic children without an eating problem and children with an identified eating problem (Table 1). A significant overall group effect was found ($F=19.1$, df 3, $p < .0001$). A multiple range test set at an .05 level also showed significant differences between the nonclinic group and the identified eating problem group and the autistic children with an eating problem. The nonclinic group did not differ significantly from autistic children who did not have an eating problem. Also there was no significant difference between the scores for the identified eating problem and the autistic children with an eating problem.

Insert Table 1 about here

46% of mothers of autistic children and 25% of nonclinic children answered "Yes" to the question "Does your child have an eating problem now ?" (Table 2). The difference was statistically

significant (X^2=6.16, df 1 p = .01). A significant difference (X^2 = 12.2, df 1, p=.0005) was also found between the number of mothers of autistic children and mothers of nonclinic children who answered "Yes" to the question "Has your child had an eating problem in the past six months ?" 58% of mothers of autistic children answered "Yes" as compared with 28% of mothers of nonclinic children.

Insert Table 2 about here

For the subgroup of autistic children who were identified to have an eating problem an item analysis was done to determine which items were endorsed "often" or "always" (scores of 4 or 5), with what frequency, and which factor each item came from. A similar analysis was done for the autistic children who did not meet criteria for an eating problem. These data are given in Tables 3 and 4. Many more items received scores of 4 or 5 in the group of children with an E/M problem. As well, the percentage of the group rating an item at 4 or 5 was often higher. Many mothers in the autistic eating problem group also endorsed items 30, 10, 33 and 40. These items, although they did not meet statistical criteria to permit them to be grouped into a factor as such (Archer & Streiner, 1991), were retained in the CEBI because of important clinical information likely to be provided by them.

Insert Table 3 & 4 about here

The mean scores on the Krug Checklist and Parenting Stress Index are shown in Table 5. On the PSI the total stress score is more than one standard deviation beyond the mean total stress score set by the test. The score from the Child Domain is two standard deviations beyond the mean. The score for the Parent Domain is still within the limits of normal variation as set by the test. On the Krug Checklist the mean total score is outside the cut-off point of 45 as set by the test. For the subscales, the scores on the body and object use, language and relating subscales are equal to or greater than those reported for autistic children.

Insert Table 5 about here

Pearson correlation analyses were done between the scores from the Arthur Scale, the CEBI, the PSI and the Krug checklist. No significant relation was found between IQ and scores on the CEBI (Table 6). For the Parenting Stress Index significant correlations were found between both scores from the CEBI and all scores derived from the PSI (Table 6).

Insert Table 6 about here

A significant positive correlation was found between the total eating problem score from the CEBI and the total score from the Krug (Table 7). There was not a significant correlation between the percentage of items perceived to be a problem on the CEBI and the total score on the Krug Checklist. Significant positive correlations were found between both scores from the CEBI and the relating, language and self-help/social subscales on the Krug.

Insert Table 7 about here

Discussion

The results of this study indicate another, but not well documented, way in which childhood autism is stressful to families. Because feeding children and family mealtimes are an integral part of child rearing and family life the presence of E/M difficulties concurrent with autism represents an increased burden of suffering for families of autistic children. Over 40% of the young autistic children in our study had an E/M problem as determined from their scores on the Revised Children's Eating Behavior Inventory. In addition, when asked to indicate whether she felt her child had had an E/M problem in the past 6 months or currently (i.e. at the time of completing the CEBI) 58% of mothers of autistic children answered "Yes" for the 6 month time span and 46% said "Yes" for a current eating problem. These results were significantly different from reports by mothers of

children in the nonclinic group. The significant positive correlations between the total scores from the CEBI and the Krug Checklist confirmed our prediction that the more severe the autism the greater likelihood of an E/M problem.

The finding that IQ level and an eating problem were not positively correlated suggests that for autistic children other factors may be more important for the development of an E/M problem. (Children with IQ's below 70 were excluded from this project; it is possible that the IQ and CEBI scores might have been positively correlated had children with lower IQ's been included). [1] An item analysis showed that for the autistic children with E/M problems, items relating to behavioural compliance and maternal attitudes (Factors 1 and 3) tended to be more strongly and frequently endorsed. Items relating to manual/oral motor function (Factor 2) tended to be less strongly and frequently endorsed.

Significant correlations were obtained between the CEBI and some but not all of the subscales from the Krug. In particular, significant correlations were found for the relating, language and social/self-help subscales, but not for the sensory and body and object use subscales. These results suggest that a possible

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[1] Although eating problems have often been reported in individuals who are retarded (Sisson & Dixon, 1986), the contribution of the lower intellectual level in relation to physiological and/or behavioural problems which are also often present is not clear. Linscheid (1983) has noted the significant contribution of behavioural difficulties to children's E/M problems even in the presence of a major developmental or neuromuscular disorder.

mechanism in autism for E/M problems is the immense breakdown in social/interactive and communicative functions. This is in contrast to other clinical groups (i.e. cerebral palsy, mentally retarded, nonorganic failure to thrive) in which E/M problems frequently occur and for whom subtle or marked oral/motor and physical problems have been identified to be prominent (but not singular) in the acquisition and/or maintenance of the E/M problems (Jones, 1989; Mathiesen, Skuse, Wolke & Reilly, 1989).

The positive correlations between the CEBI and the Parenting Stress Index confirm the stressful nature of an eating problem. In addition these results suggest that the E/M difficulties eminate primarily from the inherent difficult aspects of the autism and not from primary parenting difficulties.

The clinical implications of the findings are clear. Clinicians working with families and individuals with pervasive developmental disorders will need to be more sensitive to the possible presence of an E/M problem and provide the necessary assessment and treatment. In addition, clinicians should be especially alerted to the likely occurrance of an eating problem as the severity of the autism increases. In future research as we identify larger numbers of autistic children with eating problems, and across a wider age span, we hope to further clarify those aspects of the E/M situation and interactions which may be particularly troublesome for families with autistic children. In addition, studying E/M problems in autistic children may be helpful in coming to a better understanding of the factors which

contribute to the emergence and/or maintenance of E/M problems in nonautistic children.

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Table 1

Mean total eating problem scores (TEP) and percentage of items (% age) perceived to be a problem on the CEBI for nonclinic children, autistic children with an eating problem (AUTWITHEAT) and without an eating problem (AUTNONEAT), nonautistic children with an eating problem (NONAUTEAT).

GROUP (n)	Mean TEP (s.d.)	Mean % age (s.d.)
NONCLINIC (n=295)	38.4 (6.9)	15.8 (16.3)
AUTWITHEAT (n=14)	47.9 (6.7)*	28.2 (21.1)
AUTNONEAT (n=19)	34.9 (4.7)	8.1 (8.7)
NONAUTEAT (n=11)	49.3 (5.5)*	47.9 (15.5)

*Newman-Keuls p=.05

Table 2

Number of mothers reporting E/M problems currently or in the past 6 months for nonclinic (Group A) and autistic children (Group B).

Eating Problem	Group A (n=294)	Group B (n=33)
	N (%)	N (%)
Current	74(25)	15(46)*
6 months ago	82(28)	19(58)**

*p = .01

**p = .0005

Table 3

Items from the CEBI reported by mothers in the subgroup of autistic children with an eating problem as occurring "often" or "always", item factor loading and number of mothers.

Item	Factor[a]	Number of mothers (%)
25. My child asks for food between meals	1	10 (71)
8. My child asks for food which he/she shouldn't have	1	8 (57)
14. My child takes food between meals without asking	1	7 (50)
30. My child's behavior at meals upsets my spouse		7 (50)
32. My child interrupts conversations with my spouse at meals		6 (43)
19. I get upset when my child doesn't eat	3	5 (36)
18. My child makes foods for him/herself when not allowed	1	3 (21)

Table 3 continued...

Items from the CEBI reported by mothers in the subgroup of autistic children with an eating problem as occurring "often" or "always", item factor loading and number of mothers.

Item	Factor[a]	Number of mothers (%)
11. I feel confident my child eats enough	3	3 (21)
23. My child uses cutlery as expected for his/her age	2	2 (14)
20. At home my child eats food he/she shouldn't have	1	2 (14)
24. At friends' homes my chld eats food he/she shouldn't eat	1	2 (14)
10. My child gags at mealtimes		2 (14)
33. I get upset with my spouse at meals		2 (14)
40. My child's behavior at meals upsets our other children		2 (14)
1. My child chews food as expected for his/her age	2	1 (7)

Table 3 continued...

Items from the CEBI reported by mothers in the subgroup of autistic children with an eating problem as occurring "often" or "always", item factor loading and number of mothers.

Item	Factor[a]	Number of mothers (%)
9. My childs feeds him/herself as expected for his/her age	2	1 (7)
7. My child enjoys eating	3	1 (7)

[a] Factor 1: Behavioral Compliance
Factor 2: Manual/Oral Motor Function
Factor 3: Maternal Attitudes and Feelings

Table 4

Items from the CEBI reported by mothers in the subgroup of autistic children without an eating problem as occurring "often" or "always", item factor loading and number of mothers.

Item	Factor[a]	Number of mothers (%)
25. My child asks for food between meals	1	7 (37)
8. My child asks for food which he/she shouldn't have	1	5 (26)
14. My child takes food between meals without asking	1	2 (11)
18. My child makes foods for him/herself when not allowed	1	1 (5)

[a] Factor 1: Behavioral Compliance
Factor 2: Manual/Oral Motor Function
Factor 3: Maternal Attitudes and Feelings

Table 5

Mean scores from the Parenting Stress Index (PSI) and the Krug Autism Checklist for all autistic children (n=33).

Test	Mean	S.D.
PSI		
Total Score	264.8	132.9
Child Domain	132.9	22.2
Parent Domain	131.6	23.1
Krug Checklist		
Total Score	58.6	27.2
Sensory	7.5	5.7
Relating	13.7	8.9
Body & Object Use	14.0	7.4
Language	12.7	6.7
Social & Self-Help	13.0	5.9

Table 6

Pearson correlations between scores from the CEBI, the Leiter Scale (IQ level) and the PSI for all autistic children (n=33).

	LeiterIQ	PSITot	PSIParent	PSIChild
CEBITot	-.28	.63**	.49*	.57**
CEBI%	-.35	.59**	.43*	.59**

*p <.01

**p <.001

Table 7

Pearson correlations between CEBI scores and total and subscale scores from the Krug Autism Checklist for all autistic children (n=33).

	CEBI	
	Total	CEBI%
Krug		
Total	.45*	.38
Relating	.47*	.40*
Body Object	.07	.14
Language	.54**	.62**
Social/Self Help	.46*	.47*
Sensory	.33	.30

*p <.01

**p < .001